Adherence of Primary Care Dentists to Infection Prevention and Control Guidelines at Oral Health Services in Semarang City

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Abstract

Primary care dentists are the first destination for patients having dental and oral health problems. The primary dental health service also functions as a referral filter to advanced health facilities. Implementation of Infection Prevention and Control (IPC) in primary health care facilities has not been optimal, such as surveillance is not running well, data on infection incidence in primary health care has not been collected, and there is no supervision. This study aims to analyze the adherence of primary care dentists to the Infection Prevention and Control Guidelines at dental and oral health services. The research design was descriptive-analytic research with quantitative methods based on a cross-sectional study. Data collection was conducted from November to December 2022. The sampling technique used purposive sampling with a total sample of 102 primary care dentists who had been collected from a total population of 147 primary care dentists in Semarang City. The research was conducted by filling out a closed questionnaire. Data were analyzed by Chi-Square test and logistic regression test. There were significant relationships between perception (p=0.019), attitude (p=0.000), organizational support (p=0.011), clinic owner support (p=0.004), and dental facilities and health infrastructure (p=0.000) with adherence of primary care dentists to the Infection Prevention and Control Guidelines, whereas knowledge (p=0.748) had no relationship with the adherence of primary care dentists to the Infection Prevention and Control Guidelines. It concludes that primary care dentists in Semarang City have good adherence to Infection Prevention Control Guideline but that guidelines have not been implemented optimally.

Keywords: Adherence Dentist, Healthcare-Associated Infections, Infection Control

INTRODUCTION

Healthcare-Associated Infections (HAIs) are an infection term that occurs in patients during treatment at healthcare facilities and is caused by an infectious agent. HAIs are not limited to infection in patients, but also occur in Health Care Workers (HCWs) and visitors who are infected while in the environment of health care facilities. Transmission of cross-infection also occurs in dental practice, from patients to practitioners (dentists and dental staff), from practitioner to patient, or from one patient to another (Emini & Subandini, 2015; Kementerian Kesehatan RI, 2017).

Dental patients and Dental Health Care Workers (DHCWs) are at high risk of infection and transmission of infectious diseases due to cross-infection (Upendran et al., 2022). Infection can be spread in dental clinics through several pathways: (1) direct contact with blood, saliva, or other infected materials. (2) indirect contact with contaminated objects such as instruments, worksurfaces, or equipment. (3) contact of the mucous membrane, conjunctiva, nose, or mouth through droplets containing microorganisms from an infected patient and propelled by coughing, sneezing, or talking. (4) Inhalation of air contaminated by microorganisms whose it may persist long in the air.

Healthcare-associated Infections (HAIs) are still becoming an important problem throughout the world. WHO (2016) stated that the prevalence of HAIs in developed countries is 7% and 10% in developing countries occurs every year. The Center for Disease Control and Prevention (2020) stated that this infection continues to increase in various countries, it said that around one in 31 hospital patients suffers from at least one type of HAIs, and one in 43 nursing home residents' contracts at least one infection in association with their healthcare each day. An estimated 1.7 million HAIs occur each year contributing to the death of almost 100,000 patients, and HAIs have emerged to become the fourth leading cause of death in the USA and kill more people each year than AIDS, breast cancer, and auto accidents combined. Approximately 5–10% of hospitalized patients in the developed world acquire such infections (Center of Disease Control, 2021; Dellinger, 2016; DePaola & Grant, 2020). The incidence of HAIs in Indonesia reaches 15.74%, where this condition is far above developed countries which range from 4.8 – 15.5%, but there has been no report on the incidence of infections that specifically occur in dental practice (Kementerian Kesehatan RI, 2020).

Primary Health Care Facilities (FKTP) are primary health facilities that provide individual and non-specialized health services. FKTP is the first destination for BPJS participants when they need health services. FKTP includes public health services (Puskesmas), primary clinics (Klinik Pratama), primary care doctors, and primary care dentist’s practices. Dentists in primary health care are the first contact of health service providers who are first encountered by patients who have dental and oral health problems. Primary care dentists also functioned as referral screens to advanced health facilities (Kementerian Kesehatan RI, 2018).

Implementation of Infection Prevention and Control (IPC) in primary health care has not been optimal yet, such as surveillance is not working well, data about the incidence of infections in primary care have not been collected and there is no supervision. The emergence of the COVID-19 pandemic in 2020 has made the Ministry of Health and the professional

organization PDGI (Indonesian Dental Association) evaluate and review the rules. The rules are revised in the form of Technical Guidelines for Dental and Oral Health Services at Primary Health Care Facilities during the New Normal Era. This technical guideline is expected to be a reference for Dental Health Care Workers (DHCWs) in providing infection prevention and control services at healthcare facilities. However, there are still many primary healthcare facilities that had not met the standards of dental and oral health services based on the latest technical guidelines (Darmayanti et al., 2017).

This study aims to analyze the adherence of primary care dentists to the Infection Prevention and Control (IPC) Guidelines at dental and oral health services in Semarang City.

METHODS

The study design was descriptive-analytic research with quantitative methods based on a cross-sectional study. The research locations were primary health care clinics and primary care dentist practices in collaboration with BPJS Kesehatan in Semarang City. The population was 147 primary care dentists. Purposive sampling techniques were used to select participants for this study in which filtered by inclusion criteria. The inclusion criteria in this study were: 1) Dentists registered as members of PDGI Semarang, 2) Dentists who actively practice at primary health care clinics or primary care practice BPJS Kesehatan. The exclusion criteria in this study were: 1) Dentists that were not enrolled as members of PDGI Semarang, 2) Dentists who took paid leave from practice. The population was filtered with these inclusion criteria so that a total sample of 102 dentists was obtained. Data collection was completed by filling out a questionnaire that was filled out directly by the respondents from November to December 2022.

The independent variables in this study were knowledge, perception, attitude, dental facilities, organizational support, and clinic owner support, while the dependent variable was the adherence of dentists to IPC technical guidelines. The questionnaire consisted of 3 sections. The first part is the informed consent of the research subjects. The second part is the demographic data of respondents, such as age, gender, educational background, years of practice experience, and location of the practice.

The third part was the main questionnaire consisting of knowledge (11 multiple choice questions), perception (12 questions with the Likert scale), attitude (12 questions with the Likert scale), organizational support (7 questions with the Likert scale), clinic owner support (4 questions with the Likert scale), dental facilities and infrastructure (27 observation checklists), and adherence of primary care dentists (25 questions with the Likert scale).

The validity and reliability of the instrument were tested by testing a questionnaire on 30 primary care dentists outside Semarang City. Data were analyzed with SPSS version 26 using the Chi-square test to investigate the relationship between the independent variables and the dependent variable. Multivariate statistical analysis was also performed by logistic regression. This research had complied with the ethical clearance through certificate No.367/EA/KEPK-FKM/2022 issued by the Health Research Ethics Commission (KEPK) Faculty of Public Health, Universitas Diponegoro, and permission to conduct research from PDGI Semarang City Number: 046/PDGI/CAB.SMG/X/2022.

RESULTS

The number of respondents was 102 people, consisting of 82.4% female respondents and 17.6% male respondents. Most respondents (75.5%) were in the 26-35 age group, followed by the 17-25 age group at 11.8% and the 36-45 age group at 7.8%. Respondents with professional educational backgrounds were 93.1% and the remaining 6.9% had postgraduate education backgrounds (magister). Based on years of practical experience, most of the respondents (52%) had experience of practice more than (≥) 4 years. There 89.2% of respondents work at primary healthcare clinics in collaboration with BPJS Kesehatan and the remaining 10.8% of respondents worked as primary care dentists in collaboration with BPJS Kesehatan.

Table 1 Demographic Data and Frequency Distribution (n=102)

Research Variables	Frequency	Percentage (%)
Gender		
Male	18	17,6%
Female	84	82,4%
Age		
17–25 years old	12	11,8%
26–35 years old	77	75,5%
36–45 years old	8	7,8%
46–55 years old	2	2%
56–65 years old	2	2%
> 65 years old	1	1%
Educational Background		
Profession	95	93,1%
Postgraduate (Magister)	7	6,9%
Years of Experience		
<4 years	49	48%
≥4 years	53	52%
Practice Location		
Primary health care clinic	91	89,2%
Primary care dentist	11	10,8%
Knowledge		
Poor	41	40,2%

Good	61	59,8%
Perception		
Poor	48	47,1%
Good	54	52,9%
Attitude		
Poor	48	47,1%
Good	54	52,9%
Health Infrastructure and Dental Facilities		
Inadequate	43	42,2%
Adequate	59	57,8%
Organization Support		
Poor	47	46,1%
Good	55	53,9%
Clinics Owner Support		
Poor	43	42,2%
Good	59	57,8%
Adherence		
Poor	48	47,1%
Good	54	52,9%

Table 1. Demographic Data and Frequency Distribution shows that most of the respondents' knowledge (59,8%) was in a good category, the good perception was 52.9%, and the good attitude category was 52.9%. Most organizational support was also good at 53.9% and good support from clinical owners at 57.8%. Health infrastructure and dental facilities in most clinics were included in the adequate category (57.8%). Most of the adherence of primary care dentists in Semarang City to the Infection Prevention and Control Guidelines was in the good category at 52.9%, while 47.1% of respondents were in the poor adherence category.

Table 2 presents the relationship between the independent variables, such as knowledge, perceptions, attitudes, health infrastructure and dental facilities, organizational support, and clinic owner support with adherence of primary care dentists to the IPC Guidelines. The results of the Chi-Square analysis between knowledge and adherence variables show that the p-value is 0,748. It can be concluded that there is no significant relationship between knowledge and adherence of primary care dentists to the IPC Guidelines for Dental and Oral Health Services. The other independent variables, such as perceptions, attitudes, organizational support, clinic owner support, and health infrastructure and dental facilities have been shown to have a significant relationship with dentist adherence to the IPC Guidelines ($p<0.05$).

Table 2. Relationship Analysis of Independent Variables with Adherence of Dentists to the Infection Prevention and Control Guideline (n=102)

Independent variables	Adherence to IPC Guideline					*p-value*
	Poor		Good		Total	
	n	%	n	%		
Knowledge						
Poor	18	43,9%	23	56,1%	41	0,748
Good	30	49,2%	31	50,8%	61	
Perception						
Poor	29	60,4%	19	39,6%	48	0,019
Good	19	35,2%	35	64,8%	54	
Attitude						
Poor	33	68,8%	15	31,3%	48	0,000
Good	15	27,8%	39	72,2%	54	
Health Infrastructure and Dental Facilities						0,000
Inadequate	31	72,1%	12	27,9%	43	
Adequate	17	28,8%	42	31,2%	59	
Organizational Support						
Poor	29	61,7%	18	38,3%	47	0,011
Good	19	34,5%	36	65,5%	55	
Clinics Owner Support						
Poor	28	65,1%	15	34,9%	43	0,004
Good	20	33,9%	39	66,1%	59	

Based on the results of the multivariate analysis test, a variable that has the strongest influence on IPC guidelines adherence is the attitude variable, where respondents with a good attitude will be 6.65 times more obedient in applying the IPC guidelines compared to respondents with a poor attitude. The variable that has a strong influence after the attitude variable is health infrastructure and dental facilities. Respondents whose work units have adequate infrastructure and dental facilities will be 5.55 times more obedient than respondents whose work units have inadequate infrastructure and dental facilities.

DISCUSSION

The result of this study shows that adherence of primary care dentists to IPC guidelines in Semarang City was in a good category. There is a significant relationship between attitude, perception, health infrastructure and dental facilities, organizational support, and clinic owners' support to IPC guidelines adherence, while knowledge hasn't a significant relationship with IPC guidelines adherence. Healthcare-Associated Infections (HAIs) are still becoming a health problem in various countries in the world, including Indonesia. Based on our study, most of the primary care dentists in Semarang City were female and aged 26-35 years old. Age 26-35

according to the Ministry of Health is included in the early adulthood category. Most of the respondents (59.8%) had good knowledge about IPC. The aspects of knowledge assessment in this study were understanding IPC, nosocomial infectious agents, the transmission of pathogens, components of supporting infrastructure, and changes to the layout of practice rooms based on the latest IPC technical guidelines. Knowledge about IPC was very important for HCWs to implement an effective IPC. Knowledge was not significantly related to the adherence of primary care dentists to IPC Guidelines for Dental and Oral Health Services in Semarang City ($p<0.05$).

Table 2 shows that only 50.8% of respondents with good knowledge had good adherence, while 49.2% of respondents with good knowledge had poor adherence to implementing IPC. The results of the same research were also found by Djawan et al. (2022) and Alharbi et al. (2019) which showed that there was no significant relationship between knowledge and adherence to IPC guidelines (Alharbi et al., 2019; Djawan et al., 2022). Different research results were found by Utami et al. (2019), Palingga et al. (2020), and Dewi et al. (2020) which show there was a significant relationship between knowledge and infection control behavior (Dewi et al., 2020; Palingga et al., 2020; T. W. Utami et al., 2019). This may happen, because increased knowledge does not always lead to changes in behavior, in this case, preventive behavior. Changes in knowledge are not yet a guarantee for behavioral changes because these behaviors sometimes need enabling factors, such as material support and adequate facilities (Marzuki et al., 2021).

The perception variable has a significant relationship with dentist adherence to the IPC technical guidelines ($p=0.019$). The aspect of perception assessment in this study refers to perceived susceptibility, severity, benefits, and barriers. Most of the respondents had a good perception of the IPC technical guidelines for dental and oral health services. According to Health Belief Model’s theory, increased perceived susceptibility to certain health issues will involve behaviors to reduce the risk of developing health issues. When people think they are at risk of getting a disease, they are more likely to do something to prevent it. When people think they are not at risk or low risk, they tend to engage in less healthy behaviors. Perceived severity refers to an individual's belief about the seriousness of a disease. Severity can be based on medical consequences, such as death or disability. Perceived severity also refers to an individual's beliefs about how the condition or disease would impact their life. Perceived benefits refer to an individual's view of the value or utility of new behavior in reducing the risk of diseases. Perceived benefits refer to an individual’s opinion of the value or usefulness of new behavior in lowering the risk of disease. To make a change, people need to believe that

change will lead to a positive outcome. Perceived barriers are an individual's view of the obstacles that prevent behavior change. Barriers may be both tangible and intangible. Perception alone is often not enough to effect a change in behavior, there may be modified factors such as gender, age, ethnicity, socioeconomic background, and knowledge (Jose et al., 2021; Washburn, 2020).

The attitude variable also shows a significant relationship with the adherence of primary care dentists to the IPC technical guidelines (p=0.000). These results are in line with research by Utami et al. (2019) and Djawan et al. (2022) which shows that there was a relationship between attitude and adherence to IPC practices (Utami et al. 2019; Djawan et al. 2022) The relationship that occurs is one-way, the more positive attitude of the respondent, the better adherence to the IPC technical guidelines. Study results that had done by Darawad et al. (2012) also showed that attitude had a significant effect on adherence, whereas knowledge had no significant effect on adherence to infection control. These findings suggest it is important to improve attitudes towards the practice of IPC (Darawad et al., 2012). A study about factors for compliance with infection control practices in home healthcare revealed a significant positive association between infection control attitudes and adherence. This is supported by research on nurses' IPC practices. The study result indicated that adherence to infection control practices among Home Health Care nurses can be motivated more by nurses’ subjective attitudes than by the accuracy of their knowledge (Russell et al., 2018).

There is a significant relationship between organizational support and primary dentist adherence to the technical guidelines (p=0.011). PDGI has played a role in compiling IPC guidelines in the practice of dental and oral health services. Since the emergence of the COVID-19 pandemic, PDGI Semarang City has also taken an active role in helping its members adapt their practices throughout the pandemic. Professional organizations also collaborated with various parties to hold IPC seminars and training. So far, monitoring and evaluation of dental practice have only been carried out when reviewing the license to practice for the first time. The review was carried out by PDGI Semarang by reviewing administrative completeness and infrastructure according to standards. The extension of the license to practice was not reviewed by PDGI Semarang or the Department of Health Semarang (DKK Semarang). DKK Semarang through the Health Services sector (Yankes) oversees health facilities that already have operational permits. Monitoring and supervision are carried out in all matters related to the implementation of health services at health facilities. In its implementation, this section checks the completeness of administrative documents and infrastructure owned. Inspections are also carried out when health facilities are undergoing accreditation assessments. The government

has launched an accreditation program for primary clinics and independent practicing dentists. This is following the Regulation of the Minister of Health Number 34 of 2022 concerning the Accreditation of Community Health Centers, Clinics, Health Laboratories, Blood Transfusion Units, Primary Doctor Practice, and Primary Dentist Practice which was issued as a revision to the Minister of Health Regulation No. 46/2015 concerning Accreditation of Community Health Centers, Primary Clinics, Primary Doctor Practice, and Primary Dentist Practice, where one of the points that must be implemented is infection control and patient safety (Indraswari, 2020; Kementerian Kesehatan RI, 2022).

The variables of clinic owner support and dental facilities have a significant relationship with primary care dentist adherence to IPC technical guidelines. The relationship between dental facilities and adherence is positive. Based on table 2, shows that the more adequate dental facilities are, the better dentist adherence to the IPC Technical Guidelines. Adequate dental facilities are of course obtained with the support of the clinic owner. Most of the support from clinic owners in Semarang City is in a good category so the dental facilities at the clinic are also quite adequate. Similar research results were also obtained by Pradnyana & Muliawan (2021) and Ratu et al. (2022), that reported there was a relationship between the availability of infrastructure or dental facilities and the behavior of dental nurses in their efforts to prevent cross-infection and apply standard precautions (Pradnyana and Muliawan 2021, Ratu, 2022). The ease of obtaining Personal Protective Equipment (PPE) is a factor that plays an important role in complying with the standard precautions (Luo et al., 2010). Shortages of PPE and disposable medical materials (BMHP), lack of training, HCWs' ignorance, and inadequate dental facility and infrastructure were the most common barriers requiring immediate attention (Mersha et al., 2021). FKTPs that will and are currently collaborating with BPJS Kesehatan need to be credentialed and recredentialed. Based on Permenkes No. 99/2015 article 9 states that in determining the choice of Health Facilities, BPJS Health shall carry out selection and credentialing using technical criteria which include: a. Human Resources; b. completeness of facilities and infrastructure; c. Scope of service; and d. service commitment. Facilities and infrastructure contribute a value weight of 20% in the implementation of credentialing, and 15% in the implementation of recredentialing (Kementerian Kesehatan RI, 2015).

Among the 102 respondents, 52.9% respondents were in good adherence to IPC guidelines. There were still many respondents who have not complied with donning and doffing PPE in separate rooms. This is due to limited facilities in health services, especially in FKTP. The use of teledentistry also had not optimal, due to the lack of outreach to dentists in primary health care services. There were still several primary care dentists who have not

implemented four-handed dentistry. One of the obstacles to the lack of human resources for dental assistants in FKTP is caused by minimizing operational costs on clinic operational funds, especially for primary care dentist practices. This was stated by several respondents because the capitation payment system by BPJS Kesehatan was unable to cover clinic operational costs. The capitation payments system is made by way of FKTP paid in advance with a certain predetermined amount. Doctors have a contract with BPJS Kesehatan and are committed to providing primary care within a certain period without additional costs. This payment is based on the number of participants registered in the primary healthcare facilities, then multiplied by the capitation amount per person. The capitation payment system is paid once a month (Heningtyas & Dewanto, 2019; Kementerian Kesehatan RI, 2023). Limited funds also make it difficult to complete infrastructure facilities by the latest PPI Technical Guidelines, so there were still many FKTPs that had not been able to fulfill several supporting facilities with high purchase prices such as aerosol suction, rubber dam, air purifier, and exhaust fan.

CONCLUSIONS

Based on our research, concludes that primary dentists in Semarang City have good adherence to Infection Prevention Control Guideline but that guidelines have not been implemented optimally. There was a significant association between perception, attitude, dental facilities, organization support, and owner support with dentists' adherence to Infection control guidelines in Semarang City.

The government and BPJS Kesehatan should evaluate the capitation system payment. capitation nominal value needs to be adjusted based on detailed benefits packages so that clinics owner could facilitate appropriate equipment such as adequate PPE and manage dental settings in dental practice. Establishing an IPC committee should be done to oversee the implementation of IPC guidelines, especially in primary healthcare services. The Department of Health and professional organizations also should carry out routine surveillance for infection control in dental practice.

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